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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/692,531	10/19/2000	Saligrama R. Venkatesh	2872	6530
27377	7590	01/12/2006	EXAMINER	
MACMILLAN, SOBANSKI & TODD, LLC ONE MARITIME PLAZA-FOURTH FLOOR 720 WATER STREET TOLEDO, OH 43604			MICHALSKI, JUSTIN I	
			ART UNIT	PAPER NUMBER
			2644	

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/692,531

Applicant(s)

VENKATESH ET AL.

Examiner

Justin Michalski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-51 is/are pending in the application.
- 4a) Of the above claim(s) 34-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 9, 11, 12, 14, 18-20, 22, 26-28, 30, 44-46 and 48 is/are rejected.
- 7) ☒ Claim(s) 4, 6-8, 13, 15-17, 21, 23-25, 29, 31-33, 47 and 49-51 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see page 15, filed 7 September 2005, with respect to the rejection(s) of claim(s) 1, 18, 26, and 44 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Romesburg/Duttweiler.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5, 9, 11, 12, 14, 18-20, 22, 26-28, 30, 44-46, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US patent 5,796,819) in view of Duttweiler (US Patent 5,631,899).

Regarding Claim 1, Romesburg discloses a cabin communication system for improving clarity of a voice spoken within an interior cabin having ambient noise (Fig. 2, 8), said cabin communication system comprising: an adaptive speech enhancement filter for receiving an audio signal that includes a first component indicative of the spoken voice (signal T), a second component indicative of a feedback echo of the spoken voice (Signal L') and a third component indicative of the ambient noise (Signal N), said speech enhancement filter filtering the audio signal by removing the third

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component to provide a filtered audio signal (Filter 28), said speech enhancement filter adapting to the audio signal at a first adaptation rate; and an adaptive acoustic echo cancellation system for receiving the filtered audio signal and removing the second component in the filtered audio signal to provide an echo-canceled audio signal (Filter 30; Col. 5, lines 38-51)), said echo cancellation signal adapting to the filtered audio signal at a second adaptation rate. Romesburg does not disclose where the first and second adaptation rates are different from each other. Duttweiler discloses an echo canceller using two adaptive filters which are each specifically adjusted to optimize each filter for different purposes (See claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two adaptive filters with different rates optimize each filter in order to filter more than one component of a signal.

Regarding Claim 9, Romesburg discloses a cabin communication system for improving clarity of a voice spoken within an interior cabin having ambient noise, said cabin communication system comprising: an adaptive speech enhancement filter for receiving an audio signal that includes a first component indicative of the spoken voice (Fig. 2, Signal T), a second component indicative of a feedback echo of the spoken voice (Signal L') and a third component indicative of the ambient noise (Signal N), said speech enhancement filter filtering the audio signal by removing the third component to provide a filtered audio signal (Filter 28); and an adaptive acoustic echo cancellation system for receiving the filtered audio signal and removing the second component in the

filtered audio signal to provide an echo-canceled audio signal (Filter 30), wherein said speech enhancement filter and said echo cancellation system are coupled, and wherein said cabin communication performs a coupled on-line identification of noise and echoes in the audio signal to effect closed loop control of the adaptations of said speech enhancement filter and said echo cancellation system (Fig. 2; Col. 2, lines 59-65).

Romesburg does not disclose where the first and second adaptation rates are different from each other. Duttweiler discloses an echo canceller using two adaptive filters which are each specifically adjusted to optimize each filter for different purposes (See claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two adaptive filters with different rates optimize each filter in order to filter more than one component of a signal.

Regarding Claim 18, Romesburg discloses a cabin communication system for improving clarity of a voice spoken within an interior cabin having ambient noise, said cabin communication system comprising: a microphone (Fig. 2, microphone 22) for receiving the spoken voice (Signal T) and the ambient noise (Signal N) and for converting the spoken voice and the ambient noise into a first audio signal (Signal Mp), the first audio signal having a first component corresponding to the spoken voice and a second component corresponding to the ambient noise; an adaptive speech enhancement filter for filtering the first audio signal by removing the second component to provide a filtered audio signal (Filter 28), said speech enhancement filter adapting to the first audio signal at a first adaptation rate; an adaptive acoustic echo cancellation

system for receiving the filtered audio signal and providing an echo-canceled audio signal (Filter 29), said echo cancellation signal adapting to the filtered audio signal at a second adaptation rate; and a loudspeaker (Speaker 20) for converting the echo-canceled audio signal into an output reproduced voice within the cabin including a third component indicative of the first audio signal, wherein said loudspeaker and said microphone are acoustically coupled so that the output reproduced voice is fed back from said loudspeaker to be received by said microphone and converted with the spoken voice into the first audio signal, wherein said echo cancellation system removes from the filtered audio signal any portion of the filtered audio signal corresponding to the third component (Col. 2, lines 59-65). Romesburg does not disclose where the first and second adaptation rates are different from each other. Duttweiler discloses an echo canceller using two adaptive filters which are each specifically adjusted to optimize each filter for different purposes (See claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two adaptive filters with different rates optimize each filter in order to filter more than one component of a signal.

Regarding Claim 26, Romesburg discloses a method for improving a voice spoken within an interior cabin having ambient noise, said method comprising the steps of: adaptively filtering, for speech enhancement, an audio signal that includes a first component indicative of the spoken voice (Fig. 2, Signal T), a second component indicative of a feedback echo of the spoken voice (Signal L') and a third component

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indicative of the ambient noise (Signal N), said filtering step removing the third component to provide a filtered audio signal (Filter 28), said filtering step adapting to the audio signal at a first adaptation rate; and adaptively processing the filtered audio signal to remove the second component by acoustic echo cancellation (Filter 30) to provide an echo-cancelled audio signal, said processing step adapting to the filtered audio signal at a second adaptation rate. Romesburg does not disclose where the first and second adaptation rates are different from each other. Duttweiler discloses an echo canceller using two adaptive filters which are each specifically adjusted to optimize each filter for different purposes (See claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two adaptive filters with different rates optimize each filter in order to filter more than one component of a signal.

Regarding Claim 44, Romesburg discloses a movable vehicle cabin having ambient noise, said cabin comprising: means for causing movement of said cabin, wherein at least a portion of the ambient noise during movement is a result of the movement; and a cabin communication system for improving clarity of a voice spoken within an interior of said cabin, wherein said cabin communication system comprises: a microphone (Fig. 2, microphone 22) for receiving the spoken voice (Signal T) and the ambient noise (Signal N) and for converting the spoken voice and the ambient noise into a first audio signal, the first audio signal having a first component corresponding to the spoken voice and a second component corresponding to the ambient noise; an

adaptive speech enhancement filter for filtering the first audio signal by removing the second component to provide a filtered audio signal (Filter 28), said speech enhancement filter adapting to the first audio signal at a first adaptation rate; an adaptive acoustic echo cancellation system (Filter 30) for receiving the filtered audio signal and providing an echo-canceled audio signal, said echo cancellation signal adapting to the filtered audio signal at a second adaptation rate; and a loudspeaker (Speaker 20) for converting the echo-canceled audio signal into an output reproduced voice within the cabin including a third component indicative of the first audio signal, wherein said loudspeaker and said microphone are acoustically coupled so that the output reproduced voice is fed back from said loudspeaker to be received by said microphone and converted with the spoken voice into the first audio signal, wherein said echo cancellation system removes from the filtered audio signal any portion of the filtered audio signal corresponding to the third component (Col. 2, lines 59-65).

Romesburg does not disclose where the first and second adaptation rates are different from each other. Duttweiler discloses an echo canceller using two adaptive filters which are each specifically adjusted to optimize each filter for different purposes (See claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two adaptive filters with different rates optimize each filter in order to filter more than one component of a signal.

Regarding Claims 2, 11, 19, 27, and 45, Duttweiler further discloses the first adaptation rate is greater than said second adaptation rate (Col. 5 lines 47-50).

Regarding Claims 3, 12, 20, 28, and 46, Duttweiler further discloses the rate of the first and second filters are comparatively fast and slow. Note the term "much less" is broad and therefore reads on comparatively fast and comparatively slow.

Regarding Claims 5, 14, 22, 30, and 48, Romesburg discloses the first filter filtering noise (filter 28). Duttweiler further discloses the first filter rate being comparatively slow.

Allowable Subject Matter

4. Claims 4, 6-8, 13, 15-17, 21, 23-25, 29, 31-33, 47 and 49-51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shaw (US Patent 5,610,909) discloses two adaptive filter with different rates.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (571)272-7524. The examiner can normally be reached on M-F 7-3:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM



January 6, 2006



HUYEN LE
PRIMARY EXAMINER